



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,436	01/14/2002	William Carr		8412

7590 03/20/2003
William N. Carr
251 South Mountain Avenue
Montclair, NJ 07042

EXAMINER

PRUCHNIC, STANLEY J

ART UNIT	PAPER NUMBER
----------	--------------

2859

DATE MAILED: 03/20/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/044,436

Applicant(s)

CARR ET AL.

Examiner

Stanley J. Pruchnic, Jr.

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-~~17~~²⁰ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-~~17~~²⁰ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.6 (2 sheets)
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on **15 April 2002**. The examiner has **HAS NOT** approved these drawings.
2. The drawings are objected to because:
 - a. In Figure 1, the leader line attached to the lens has no reference character associated with it. Please remove the leader line or insert a reference character.
 - b. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following elements or features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered:

- c. the electrodes (Claim 6);
- d. the gap (Claim 7);
- e. the heater element external to the platform (Claim 11) ;
- f. the temperature sensors (Claim 12);
- g. the photodetector integrated into the planar substrate (Claim 18);
- h. the vacuum chamber (Claim 19); and
- i. the enclosing microstructure (Claim 20).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:
- j. On Page 5, in Line 6, the patent number is incorrect. Please, after "patent", delete "5,087,661" and replace therefor --6,087,661--.
 - k. On Page 7, in the last line (of the Substitute Spec.) perhaps it would be clearer to delete "the" ***before*** "microactuation" and insert --as-- ***after*** "microactuation".

Appropriate correction is required.

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

6. Claims 1, 3, 15, 18 and 19 are objected to because of the following informalities:
MPEP § 608.01(m) states (in part) that

While there is no set statutory form for claims, the present Office practice is to insist that each claim must be the object of a sentence starting with "I (or we) claim", "The invention claimed is" (or the equivalent). If, at the time of allowance, the quoted terminology is not present, it is inserted by the clerk. Each claim begins with a capital letter and ends with a period. Periods may not be used elsewhere in the claims except for abbreviations. See *Fressola v. Manbeck*, >36 USPQ2d 1211< (D.D.C. 1995). ** >Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation, 37 CFR 1.75(i).<

There may be plural indentations to further segregate subcombinations or related steps. In general, the printed patent copies will follow the format used but printing difficulties or expense may prevent the duplication of unduly complex claim formats.

- a. In Claim 1, Line 9, please delete the period (".") and replace therefor with a semi-colon (";"), and in Line 14, please insert a period (".") after the final word in the claim, "platform".
 - b. The use of punctuation throughout the claims needs to be corrected, since, for example, Claims 3, 15, 18 and 19 do not end with a period (".").
 - c. Perhaps the claims would be clearer if the asterisks ("*") were not used, but indentation used instead to indicate the beginning of the description of those claimed elements in Claim 1.
 - d. At the end of a description of a claim element, a semicolon (;) would be appropriate, for example, in Claim 1, Line 3, please insert a semicolon (;) after the word "mirror". Please correct all the claims in like manner.
 - e. The word "planer" in Claim 1, Line 3, and throughout all the claims, is incorrectly spelled. Please delete the word "planer" and replace therefor the word --planar--.
7. Claims 1-20 are objected to because of the following informalities: --a--, --an--, --said-- or --the-- should be added to the claims where appropriate to provide proper antecedent basis. Applicant is reminded that either --a-- or --an-- should be used when an element is identified for the first time, and that --the-- or --said-- should be used when the element is mentioned again. For example,
- a. --said-- should be inserted before "underlying" in line 12 of Claim 1 in order to more clearly indicate this is referring to the substrate introduced in Line 3; and
 - b. In Claim 6, in lines 1-2, the limitation "the substrate electrode" lacks antecedent basis. Perhaps "the" before "substrate" in Line 1 should be deleted and replaced therefor with --a--; and
 - c. In Claim 20, in Line 2, "the pyro-optical film" lacks antecedent basis, etc.
- Applicant should review all the claims to ensure proper antecedent basis.
- Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The term "low-level" in claim 1 is a relative term, which renders the claim indefinite. The term "low-level" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
- In Claim 1, Line 10, "a controlled thickness" makes the claim language confusing, because it is clear from the specification that this is not referring to the apparatus itself, but how it is made. The term "controlled thickness" would appear to suggest to one of ordinary skill in the art that the invention requires the ability of controlling the pyro-optical film thickness in normal use, but there is no antecedent basis in the specification for that, therefor Applicant's intention is made unclear by the confusing claim language.
- In each of Claims 5 and 6, "the photodetector" lacks antecedent basis and makes the claim language confusing because it is not clear whether the photodetector is intended to be claimed as part of the claimed invention, or the invention is only required to be able to be used with a photodetector.

Art Unit: 2859

10. Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements in claim 5 are: a means for synchronous gating, a means for chopping the radiation -- no additional elements are positively claimed in this claim, but only functional relationships are claimed. Since none of these elements are positively claimed, the invention is only considered to be limited in that it is required to be able to be used in the manner claimed. In claims 6-7, the omitted elements are the photodetector and means for synchronous gating of the photodetector with the periodic movement of the electrostatic actuator and platform.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claim 20 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by LEE *et al.* (U. S. Pat. No. 5,629,521, hereinafter **LEE**).

LEE discloses an enclosing microstructure as claimed by Applicant in Claim 20, said enclosing microstructure (Col. 5, Lines 26-40) being capable of maintaining a partial vacuum surrounding a pyro-optical film as claimed by Applicant.

Allowable Subject Matter

13. Claim 1 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

14. Claims 2-20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: Claim 1 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, because the prior art fails to teach or fairly suggest a micromachined pixel structure comprising a pyro-optical film integral to a platform wherein the optical transmission through the pyro-optical film for a topside-incident optical carrier beam is modulated by the platform temperature as defined in the claims, in combination with the other limitations, each arranged and functioning as recited in claim 1. Claims 2-20 would be allowable by virtue of their dependency upon claim 1.

16. Of the prior art disclosed by Applicant, U. S. Patent No. 4,594,507, U. S. Patent No. 4,751,387 and U. S. Patent No. 5,100,218 describe thermal imaging systems employing liquid crystal pyro-optic materials. U. S. Patent No. 5,512,748 (Col. 6, Line 51-Col. 7, Line 12) and U. S. Patent No. 4,994,672 (Col. 3, Lines 16-50) describe thermal imaging systems employing pyro-optic materials which may also include ferroelectric and pyroelectric materials. The "lens forming" materials disclosed by Gupta

et al. (U. S. Patent No. 4,262,198) are similarly used for thermal imaging systems by virtue of the effect of thermal modulation on their optical properties.

17. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related micromachined pixel structures.

U. S. Patent No. 6,194,721 and U. S. Patent No. 6,124,593 (the "Bly" patents) teach using Fabry-Perot structures controllable by an electrostatic field to optimize absorption of incoming IR radiation by a membrane 20 which changes shape and thereby modulates visible or near-IR light reflected off the membrane. The membrane 20 is not a pyro-optical material as claimed by Applicant.

U. S. Patent No. 6,097,031 (Cole) and U. S. Patent No. 5,589,689 (Koskinen) include Fabry-Perot elements for optimizing sensitivity in desired wavebands. Neither Cole nor Koskinen disclose or suggest the capability of modulating an optical carrier beam. Neither Cole nor Koskinen disclose or suggest a pixel structure including a pyro-optical film integral to a platform in which the optical transmission through the pyro-optical film for a topside-incident optical carrier beam is modulated by the platform temperature.

Art Unit: 2859

The other art of record not mentioned above include at least some features in common with the claimed invention.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr. whose telephone number is (703) 306-5474. The examiner can normally be reached on weekdays (Monday through Friday) especially from 8:30 AM to 11:00 AM and 12:00 PM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached on (703) 308-3875.

The **Official FAX** number for Technology Center 2800 is (703) 872-9318 for **regular** communications and (703) 872-9319 for **After Final** communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2800 receptionist whose telephone number is (703) 308-0956. The Technology Center 2800 Customer Service fax phone number is (703) 872-9317.



**DIEGO F. F. GUTIERREZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800**



Stanley J. Pruchnic, Jr.
18 March 2003